

## COMPACT SYSTEM MODULE WITH BUILT-IN THERMOELECTRIC COOLING

5        This application is a divisional of U.S. Application No. 09/144307  
   NOW U.S. PATENT 6,586,835  
filed on August 31, 1998, which is incorporated herein by reference.

### Field of the Invention

          The present invention relates generally to semiconductor integrated circuits.  
10    More particularly, it pertains to a compact system module with built-in thermoelectric cooling.

### Background of the Invention

          Integrated circuit technology relies on transistors to formulate vast arrays of  
15    functional circuits. The complexity of these circuits requires the use of an ever increasing number of linked transistors. As the number of transistors required increases, the integrated circuitry dimensions shrink. It is one objective in the semiconductor industry to construct transistors and other discrete devices which occupy less surface area on a given silicon chip/die. At the same time, the  
20    semiconductor industry seeks to increase the speed and power offered by integrated circuits. One approach to the latter challenge is through the development of improved methods for electrically connecting and packaging circuit devices which are fabricated on the same or on different silicon chips.

          Ideally, we would like to build a computing system by fabricating all the  
25    necessary integrated circuits on one wafer or chip, as compared with today's method of fabricating many chips of different functions and packaging them to assemble a system. A true "system on a chip" would greatly improve integrated circuit performance and provide higher bandwidth. Unfortunately, it is very difficult with